Five-Year Review Report

Velsicol Chemical Corporation
Clark County, Marshall, IL

Pursuant to CERCLA

Prepared by:
Illinois EPA for
U.S. Environmental Protection Agency
Region 5
Chicago, Illinois

William E Muno, Director
Superfund Division

9/22/03
Date

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CACO	Consent Agreement Compliance Order
CAFO	Consent Agreement Final Order
CIL	Compliance Inquiry Letter
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
IAC	Illinois Administrative Code
IAGO	Illinois Attorney General's Office
IEPA	Illinois Environmental Protection Agency
LTRA	Long-Term Remedial Action
MCL	Maximum Contaminant Level
NCP	National Priorities List
O&M	Operation and Maintenance
PECL	Preliminary Enforcement Conference Letter
POTW	Public Owned Treatment Works
PRP	Potentially Responsible Party
RA	Remedial Action
RCRA	Resources Conservation and Recovery Act
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
USEPA	United States Environmental Protection Agency
USDOJ	United States Department of Justice

Executive Summary

The remedy for the Velsicol Chemical Corporation Superfund Site in Marshall, Illinois included a groundwater collection and treatment system, landfill cap installation, groundwater monitoring, and institutional controls. The Site achieved remedial action construction completion in 1996. The trigger for the five-year review was the start date of the remedial action in May 1992.

The assessment of this five-year review found that the remedy was constructed in accordance with requirements of the interim and final Record of Decisions (ROD). The remedy is functioning as designed. The immediate threats have been addressed and the remedy is expected to be protective when all groundwater cleanup goals are achieved within the next 100 years.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name (*from WasteLAN*): **Velsicol Chemical Marshall Plant** Superfund Site		
EPA ID (*from WasteLAN*): ILD000814673		
Region: 5	**State:** IL	**City/County:** Winnebago County
SITE STATUS		
NPL status: √Final ☐ Deleted ☐ Other (specify)		
Remediation status (choose all that apply): ☐ Under Construction x Operating ☐ Complete		
Multiple OUs?* ☐ YES √NO	**Construction completion date:** 09 / 30 / 1994	
Has site been put into reuse? ☐ YES √NO		
REVIEW STATUS		
Lead agency: ☐ EPA √State ☐ Tribe ☐ Other Federal Agency		
Author name: Eric D. Runkel		
Author title: State Project Manager	**Author affiliation:** Illinois EPA	

Review period:** 09 / 30 /2002 to 09 /30 /2003
Date(s) of site inspection: 06 /10 /2003
Type of review: √Post-SARA ? Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion
Review number: ☐ 1 (first) √ 2 (second) ☐ 3 (third) ☐ Other (specify)
Triggering action: ☐ Actual RA Onsite Construction at OU #_____ ☐ Actual RA Start at OU#_____ ☐ Construction Completion √ Previous Five-Year Review Report ☐ Other (specify)
Triggering action date (*from WasteLAN*): 09/10/1998
Due date (*five years after triggering action date*): 09/10/2003

* ["OU" refers to operable unit.]

** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

Scheduled sediment sampling in the unnamed tributary has been delayed due to access issues. IEPA is assisting the PRP in gaining access. The proposed locations are of concern because the remedy selected for the unnamed tributary specified sampling at the Five-Year Review mark to ensure contaminates are not increasing over Federal and State standards or cleanup objectives set for the site. This sampling is scheduled for later this calendar year.

Recommendations and Follow-up Actions:

With a few exceptions, the performance standards for the Site are being achieved. Therefore, the recommendation resulting from this Five-Year Review would be to continue operation and/or maintenance of the remedy components until all performance standards are achieved as shown in Table 1-1.

I recommend the continued operation and maintenance of the landfill cap, and groundwater collection system, and monitoring well network until cleanup standards are achieved. I recommend that the U.S. EPA retain the enforcement lead and EPA retain the technical lead for this site. I recommend that EPA evaluate proposals to further upgrade the landfill slope and/or groundwater collection system if submitted. The recommendation resulting from this Five-Year Review would be to continue operation and/or maintenance of the long-term remedy components until all performance standards are achieved. These remedy components would include the groundwater control system and the gas management system. Landfill cap inspections, and all other inspections, groundwater monitoring activities, groundwater sampling, and reporting should continue as required by the ROD or as revised by U.S. EPA.

Protectiveness Statement(s):

The remedy is expected to be protective of human health and the environment upon attainment of groundwater cleanup goals which is expected to require 100 years to achieve. In the interim, exposure pathways that could result in unacceptable risks are being controlled and institutional controls are preventing exposure to, or the ingestion of, contaminated groundwater. All threats at the Site have been addressed through upgrading the landfill cap, the installation and operation of a groundwater control system, operation of a gas management system, fencing to prevent access to the Site, and the implementation of institutional controls.

Long-term protectiveness of the remedial action will be verified by obtaining additional groundwater samples to fully evaluate potential migration of contaminants down gradient from the Site and towards the Unnamed Tributary. Monitoring of the groundwater will be a component to ensure the long-term protectiveness of this remedy. Current data indicate that a plume had not migrated off-site. Sampling and analysis will be continued on a quarterly basis. Current monitoring data indicate that the remedy is functioning as required to achieve groundwater goals.

U.S. Environmental Protection Agency
Region 5
Five-Year Review Report
Velsicol Chemical Corporation
Clark County, Marshall, IL

I. INTRODUCTION

The purpose of a five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The Agency is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the NCP; 40 FR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

The United States Environmental Protection Agency (U.S. EPA), Region 5, conducted the five-year review of the remedy implemented at the Velsicol Chemical Corporation Superfund Site in Marshall, Illinois ("the Site"). This review was conducted by the State Project Manager (SPM) for the entire Site from November 2002 through May 2003. This report documents the results of the review.

This is the second five-year review for the Site. The triggering action for this statutory review is the completion of the first Five-Year Review on September 10, 1998. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. This review will be placed in the Site files and local repository for the Velsicol Chemical Corporation Superfund Site (the "Site") in Clark County, Marshall, Illinois.

II. CHRONOLOGY

Event	Date
USEPA proposes to place Velsicol on NPL.	12/30/82
Velsicol NPL Listing	09/08/83
RCRA CIL.	07/25/84
AGO referral for Act, RCRA, CERCLA, and CWA violations.	01/17/85
RI/FS initiated by IEPA.	09/30/84
RCRA CIL.	05/09/86
PECL for violations from 05/09/86 CIL plus financial assurance and UIC violations.	06/26/86
Violations from PECL and 7/25/84 CIL referred to USEPA.	12/23/86
IEPA completes Remedial Investigation report.	02/19/88
IEPA completes Feasibility Study.	07/15/88
Velsicol ceases manufacturing chlordane at facility	08/30/88
RCRA CACO.	09/22/88
ROD including Remedial Action Plan approved by IEPA.	09/26/88
ROD approved by USEPA.	09/30/88
CERCLA consent decree. Signatories include USEPA, USDOJ, IEPA, IAGO, and Velsico.	03/06/89
CERCLA consent decree becomes effective.	09/15/89
RCRA CAFO executed by USEPA.	09/29/89
Remedial Design Approved	03/29/91
RA Mobilization begins	06/10/91
Remedial construction completed.	1994
RCRA inspection.	04/26/95
Long-term groundwater remediation begun	1995
Analytical parameter sampling list modified.	07/17/97
1st Five-year Review completed.	09/10/98

III. BACKGROUND

Physical Characteristics

The former Velsicol Chemical Corporation manufacturing facility is located in east-central Illinois, approximately one mile north of the City of Marshall, Clark County, Illinois, along State Highway Route 1 (see Figure 1-1) Interstate Highway 70 is approximately.0.6 miles north of the plant. Velsicol's property occupies an area of approximately 420 acres, of which 86 acres were utilized as a chemical production facility and on-site ponds. The Site has been operating as a chemical production facility since the 1930s. Velsicol produced various chemicals such as petroleum derivates, resins, solvents, rubber extenders and technical grade Chlordane. Soils, sediments, surface water and groundwater were found to be adversely impacted on and off the Site from the facility.

Initial Response

The U.S. EPA placed the Site on the National Priorities List (NPL) on September 8, 1983 (48 FR 40658). The Illinois Environmental Protection Agency (IEPA) conducted the remedial investigation and feasibility study (RI/FS) for the Site from 1984 - 1988. The RI/FS concluded that soils, groundwater and surface water in the immediate area had been impacted by the facility. The Consent Decree for remedial design/remedial action (RD/RA) was signed by the potentially responsible party on December 29, 1988, the State of Illinois on January 23, 1989 and U.S.EPA on March 6, 1989. It became effective on September 15, 1989 upon being entered into Federal Court. The remedial design was completed by March 29, 1991. The remedial action activities began with contractor mobilization on June 10, 1991. The RA includes a long-term remedial action (LTRA) for groundwater. The groundwater collection system is projected to complete capture across the Facility in the year 2005. All construction for the Remedial: Action was completed by September 30, 1994.

Basis for Taking Action

Hazardous substances were detected in groundwater above Federal and/or State drinking water standards. Chlordane was produced at this facility and is a known carcinogen. Devonian depth underground injection wells were utilized at the facility for disposal. Treatment ponds were routinely discharged to local surface waters in violation of Federal and/or State standards.

IV. REMEDIAL ACTIONS

Remedy Selection

The final remedial action objectives of the ROD were to excavate and stabilize contaminated soils into 5/6 Pond, backfill excavated areas with common fill, cap 5/6 Pond, actively treat groundwater, closure of two waste disposal deep wells, realign the unnamed tributary. The final RA includes:

Excavation, stabilization and consolidation of contaminated material in 5/6 Pond;

the installation of the landfill cap to reduce infiltration, reduce surface gas emissions, and control erosion;

backfill excavated areas with common fill;

the implementation of institutional controls to restrict on-site groundwater usage;

the continued operation of the groundwater collection system;

the installation of additional groundwater monitoring wells and closure of specified wells;

the closure of waste disposal deep wells No. 1 and No. 2;

the monitoring of the groundwater and the unnamed tributary with long-term action levels established to reopen the ROD, if necessary; and

the long-term operation and maintenance (O&M) of the landfill cap, monitoring well network, groundwater collection system, and fence.

Remedy Implementation

A legal survey was completed for the Velsicol property. Closure of waste disposal well No. 1 and well No. 2 was completed January 1990 and February 1994, respectively. Annual mechanical integrity testing of deep disposal well No. 2 was conducted and continued until deep disposal well No. 2 ceased operation and was closed. Sediments in the unnamed tributary between the Facility and Velsicol's western property boundary and sediments in the off-site unnamed tributary were excavated from Velsicol's western property boundary downstream approximately 2,000 feet. PRP's have decommissioned the Facility and consolidated, stabilized and capped all excavated material, approximately 90,000 cu/yds from the Facility, the unnamed tributary, 2 Pond, 4 Pond into 5/6 Pond. Approximately 150,000 cu/yds of common fill and clays were utilized to restore the excavated areas. PRP's constructed a collection drain east of the 5/6 Pond in July 1991. Groundwater is being collected by the collection basin, treated on-site through an air stripper and a dual carbon treatment system, monitored to ensure compliance with cleanup objectives and released to the POTW. The groundwater analytical parameter list required for long-term monitoring was reduced in July 1997. This is being attributed to the removal and stabilization of large source areas during RA. Physical capture of the groundwater beneath the Facility is projected to occur in the year 2005.

The final remedy selected included excavation and stabilization of contaminated soils and placement in 5/6 Pond, capping 5/6 Pond to reduce infiltration, control erosion, and reduce gas emissions; relocation of the unnamed tributary; restricted use of on-site groundwater and soils through institutional controls; continued operation and, maintenance of the groundwater collection system; modification to the ground water monitoring program, which included installation of new wells, as well as closure of monitoring wells; continued long-term monitoring of the unnamed tributary; as well as long-term operation and maintenance of the landfill cap and its associated components.

System Operation/Operation and Maintenance

The PRP's have implemented a long-term operation, maintenance and monitoring program. Ground water is being extracted through a10' collection basin located along the eastern slope of the 5/6 Pond landfill. Ground water is treated on site through an air stripper and a dual carbon treatment system, monitored to ensure compliance with cleanup objectives and released to the POTW. Approximately 2.25 million gallons of ground water has been treated since the beginning of the LTRA. The ground water analytical parameter list required for long-term monitoring was reduced in July 1997. This is being attributed to the removal and stabilization of large source areas during RA. Physical capture of the ground water beneath the Facility is projected to occur in the year 2005. The long-term projection for groundwater capture across the entire site, as outlined in remedial design, is approximately 100 years. Institutional deed and land use restrictions including the Facility, the

unnamed tributary within confines of the Velsicol property and agricultural lands adjacent to the west boundaries of the Facility, are currently being reviewed.

V. PROGRESS SINCE LAST FIVE-YEAR REVIEW

Since the last Five-Year Review, the Site continued to operate in accordance with the ROD and the administrative orders. The protectiveness statement from the last review stated that the remedies selected for this Site remained protective of human health and the environment. The recommendations cited in the last Five-Year Review stated that the PRP's should continue operation and maintenance of the landfill cap, the groundwater treatment system, the groundwater collection system, and the monitoring well network until the achievement of cleanup standards. Operation and maintenance of the landfill cap, gas and leachate systems, and monitoring well network have continued at the Site.

VI. FIVE-YEAR REVIEW PROCESS

Administrative Components

The Velsicol Chemical Corporation Five-Year Review team was led by Eric Runkel of the Illinois EPA, Project Manager for the Velsicol Chemical Corporation Superfund Site.

Also, Bill Hammel Illinois EPA, the Community Relations coordinator coordinator and Paul Jagiello, Illinois EPA, Legal Counsel participated in the Five-Year Review process. Jon Peterson, U.S. Environmental Protection Agency assisted as the representative for the lead agency.

From November 2002 to May 2003, the review team established and followed the review schedule as follows:

- Document Review;
- Data Review;
- Community Involvement;
- Press Release;
- Site Inspection;
- Five-Year Review Report Development and Review

The public was notified of the Five-Year Review in April 2003 through press releases.

Document Review

This Five-Year Review consisted of a review of relevant documents including O&M records, inspection reports, groundwater monitoring results. Applicable groundwater cleanup standards and performance standards for the remedy were reviewed. The major groundwater performance standards are as shown below:

> The concentration of hazardous substances in the groundwater beyond the Site borders should not exceed Federal Maximum Contaminant Levels or other health based criteria;

Action levels for monitoring wells with exceedances of a Primary Drinking Water Standard as defined in 40 C.F.R. 141 or an exceedance of the cumulative carcinogenic risk levels for a lifetime drinking water supply of $1x10^{-6}$.

VII. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, risk assumptions, and the results of the site inspection indicate that the remedy is functioning as intended by the Site RODs. The installation of the groundwater collection system, removing, stabilizing, landfilling contaminated material, and maintaining the landfill cap have achieved the remedial objectives to minimize the migration of contaminants to groundwater, to minimize the migration of contaminants in soil and sediments. The installation of the Site fence has prevented exposure to, or ingestion of, contaminated groundwater.

Operation and maintenance of the groundwater collection system and landfill cap maintenance program have been effective. Equipment repairs or replacements to remedial systems were made as necessary and identified to the IEPA. Annual O&M costs are consistent with anticipated cost estimates and there is no indication of any difficulties with remedy.

There were no opportunities for system optimization observed during this review. The monitoring well network provides sufficient data to assess the progress of the remedy at the Site. Maintenance of the landfill cap is sufficient to maintain the overall structural integrity of the cap.

Institutional controls are being implemented for the Site. They will include prohibitions on the use or disturbance of groundwater at the Site and prohibitions on disturbances of the landfill cap, and any other activities or actions that might interfere with the implemented remedy. No activities were observed that would have violated the intent of proposed institutional controls. The cap and the surrounding area were undisturbed. There were no new uses of groundwater observed at the Site. The fence around the Site is intact and in good condition.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy.

Changes in standards and Things to be considered

As the remedial work has been completed, most ARARs or performance standards cited in the ROD have been met. ARARs that still must be met at this time and that have been evaluated include: the Safe Drinking Water Act (40 CFR 141.11-141.16) and Groundwater Standards (35 IAC 620) from which many of the groundwater cleanup levels were derived – Maximum Contaminant Levels (MCLs). There have been no changes in these ARARs and no new standards affecting the protectiveness of the remedy.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures (older child trespasser, adult trespasser) and potential future exposures (young and older future child resident, future adult resident and future adult worker). There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment. These assumptions are considered to be conservative and reasonable in evaluation risk and developing risk-base cleanup levels. No change to these assumptions or the cleanup levels developed from them is warranted. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. The remedy is progressing as expected and it is expected that all groundwater goals will be maintained in the future should the Site conditions and surroundings remain constant.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new ecological targets were identified during the Five-Year Review. Therefore, monitoring of ecological targets will continue as outlined in the ROD. There were no weather-related events have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed and the site inspections, the remedy is functioning as intended by. the final ROD. There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. Many of the ARARs or performance standards for the Site, as described in the ROD, have been met. There are some performance standards that have not been achieved. There have been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

VIII. ISSUES

Scheduled sediment sampling in the unnamed tributary has been delayed due to access issues. IEPA is assisting the PRP in gaining access. The proposed locations are of concern because the remedy selected for the unnamed tributary specified sampling at the Five-Year Review mark to ensure contaminates are not increasing over Federal and State standards or cleanup objectives set for the site. This sampling is scheduled for later this calendar year.

IX. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

With a few exceptions, the performance standards for the Site are being achieved. Therefore, the recommendation resulting from this Five-Year Review would be to continue operation and/or maintenance of the remedy components until all performance standards are achieved as shown in Table 1-1.

I recommend the continued operation and maintenance of the landfill cap, and groundwater collection system, and monitoring well network until cleanup standards are achieved. I recommend that the U.S. EPA retain the enforcement lead and IEPA retain the technical lead for this site. I recommend that IEPA evaluate proposals to further upgrade the landfill slope and/or groundwater collection system if submitted. The recommendation resulting from this Five-Year Review would be to continue operation and/or maintenance of the long-term remedy components until all performance standards are achieved. These remedy components would include the groundwater control system and the gas management system. Landfill cap inspections, and all other inspections, groundwater monitoring activities, groundwater sampling, and reporting should continue as required by the ROD or as revised by U.S. EPA.

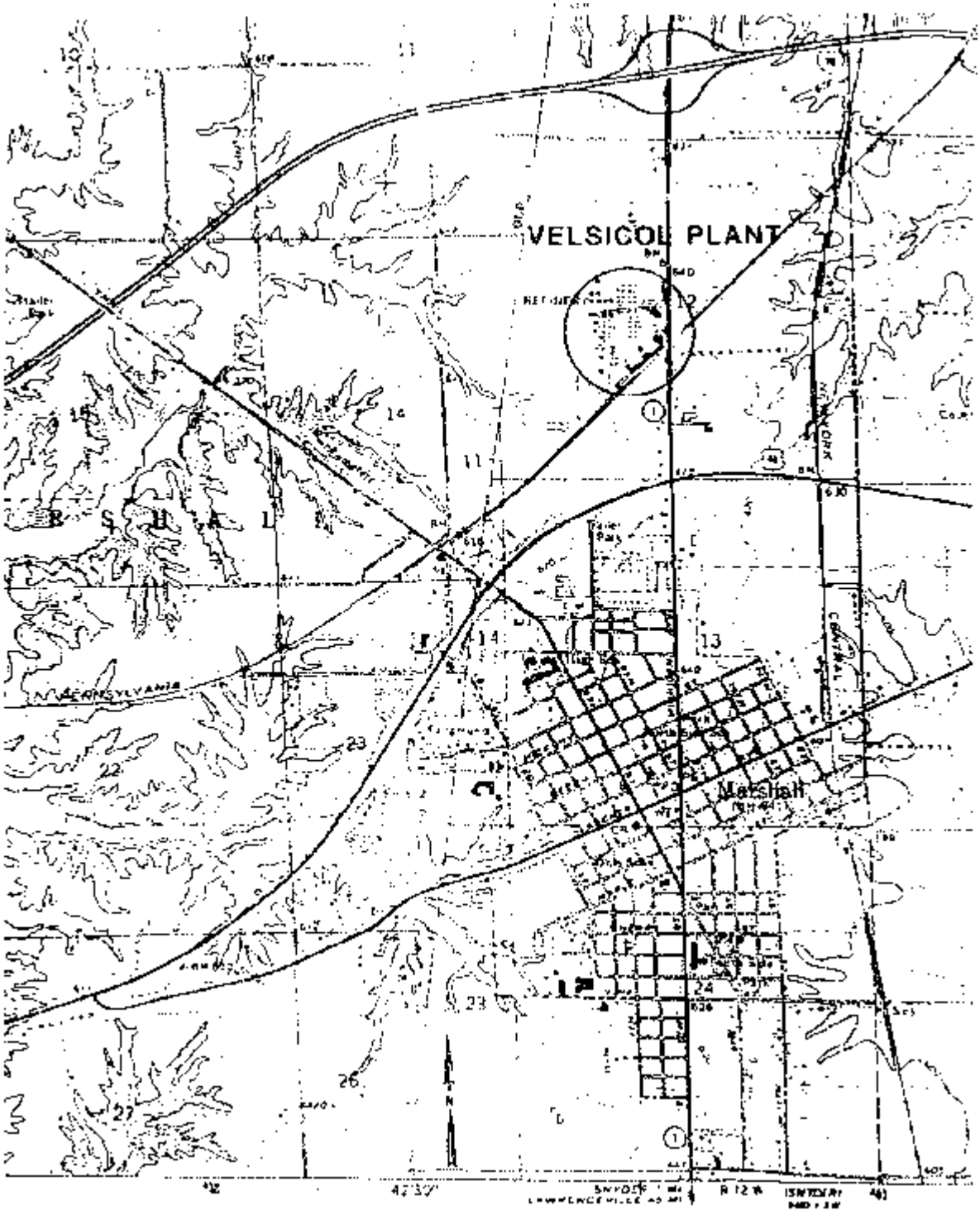
X. PROTECTIVENESS STATEMENT

The remedy is expected to be protective of human health and the environment upon attainment of groundwater cleanup goals which is expected to require 100 years to achieve. In the interim, exposure pathways that could result in unacceptable risks are being controlled and institutional controls are preventing exposure to, or the ingestion of, contaminated groundwater. All threats at the Site have been addressed through upgrading the landfill cap, the installation and operation of a groundwater control system, operation of a gas management system, fencing to prevent access to the Site, and the implementation of institutional controls.

Long-term protectiveness of the remedial action will be verified by obtaining additional groundwater samples to fully evaluate potential migration of contaminants down gradient from the Site and towards the Unnamed Tributary. Monitoring of the groundwater will be a component to ensure the long-term protectiveness of this remedy. Current data indicate that a plume had not migrated off-site. Sampling and analysis will be continued on a quarterly basis. Current monitoring data indicate that the remedy is functioning as required to achieve groundwater goals.

VII. NEXT FIVE-YEAR REVIEW

The next Five-Year Review will be completed by September 2008, which is five years from the date of this Five-Year Review.



SOURCE: USG& QUADRANGLE **FIGURE 1 - 1** **SCALE: 1:24000**

SITE LOCATION MAP

Table 1-1

Chemical Specific Objectives for Groundwater and Surface Water for the Velsicol Chemical Corporation Superfund Site established in 1988.

PARAMETERS	OBJECTIVE (ug/L)[1]
Hexachlorocyclopentadiene	0.7
Hexacloroethane	98
Isophore	14,500
Naphthalene	230
2-Methyl Naphthalene	900
Benzo(a)anthracene	1.0
Benzo(a)pyrene	0.5
Acenaphthene	60.8
Anthracene	2.3
Fluoranthene	398
Phenathrene	10
Nitrobenzene	4,300
N-Nitrosodiphenylamine	16.1 (off site); 585 (on site)
Pentachlorophenol	2.4
Phenols (total)[2]	100
Chlordane	0.00048 (off site); 0.2 (on site)
Barium	5,000
Boron	1,000
Copper	20
Lead	100
Zinc	1,000

Footnotes:

1 - Measured in micrograms per liter.

2 - Include phenol, 2-methylphenol, and 2,4-dimethylphenol

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